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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,778	01/10/2001	Arnaud Gueguen	201587US2	6492

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EXAMINER	
TORRES, JOSEPH D	

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/756,778	GUEGUEN; ARNAUD	
	Examiner	Art Unit	
	Joseph D. Torres	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,8-11,13-22,24 and 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,8-11,13-22,24 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-4, 6, 8-11, 13-16, 18-22 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Moher; Michael I. (US 6161209 A).

35 U.S.C. 102(e) rejection of claim 1.

Moher teaches performing error-correction encoding of digital data to produce error-correction encoded digital data (Figure 9 Moher); transmitting the error-correction encoded digital data over at least one communication channel (Figure 9 Moher); receiving the error-correction encoded digital data from the at least one communication channel to provide received error-correction encoded digital data (Figure 9 Moher); decoding the received error-correction encoded digital data using a turbo decoding process to determine a decoded characteristic statistical quantity from a set of weighted output information (Figure 8 of Moher teaches decoding the received error-correction encoded digital data **y**(i) using a turbo decoding process to determine a decoded

characteristic statistical quantity soft output data from Soft Output Decoding Means 1-K from a set of weighted output information soft output feedback data from Soft Output Decoding Means 1-K; Note: soft output data from Soft Output Decoding Means 1-K is statistical data since soft data provides information on the statistical reliability of a hard estimate; Note also oft output feedback data from Soft Output Decoding Means 1-K is weighted information since soft data is weighted information indicating a most likely value depending on the weighing distribution of the soft vlaue); and determining a decoded information quality parameter from the determined decoded characteristic statistical quantity and from at least one configuration parameter (the Estimating Reliability Means in Figure 8 of Moher determines a decoded information quality parameter provided to Soft Output Decoding Means 1-K from the determined decoded characteristic statistical quantity soft output data from Soft Output Decoding Means 1-K hat is feedback to the Estimating Reliability Means and from at least one configuration parameter Interference Model p(y|b) in Figure 3 of Moher) that is a system parameter indicating at least one of coding conditions, communication channel transmission conditions, and decoding conditions (configuration parameter Interference Model p(y|b) in Figure 3 of Moher is a system parameter indicating communication channel transmission conditions), said decoding conditions characterizing the system portion for which the decoded information quality is determined (configuration parameter Interference Model p(y|b) in Figure 3 of Moher characterizes the system channel portion for which the decoded information quality provided to Soft Output Decoding Means 1-K is determined), wherein the determined decoded information quality parameter is a

numerical scalar or an integer number representing a probable number of errors existing in a set of decoded information items (determined decoded information quality parameter $p(b_k(i)=1|\mathbf{y})/ p(b_k(i)=0|\mathbf{y})$ in Figure 3 of Moher is a numerical scalar representing a probable errors existing in a set of decoded information items; Note: determined decoded information quality parameter $Pr(b_k(i)=1|\mathbf{y})/Pr(b_k(i)=0|\mathbf{y})$ is an indication of probable errors existing in a set of decoded information items due to interference), and when the determined decoded information quality parameter is the numerical scalar, using the numerical scalar to determine a weighting factor (Equation 2 in column 12 of Moher teaches determined decoded information quality parameter $Pr(s(t)|\mathbf{w})$ determine a weighting factor for $\lambda(t)$).

35 U.S.C. 102(e) rejection of claims 2 and 3.

The algorithm in Moher is iterative whereby all of the steps are carried out iteratively one after another (Figure 8 of Moher).

35 U.S.C. 102(e) rejection of claim 4.

Moher teaches each of the elementary decoding steps uses part of the received information, which corresponds to a redundant information item associated with the corresponding elementary coding step (each of the elementary decoding steps in Figure 2 of Moher uses part of the received information, $y_1,\ldots, y_k$, which corresponds to a redundant information item associated with the corresponding elementary coding step), for generating an output information item comprising an extrinsic information item

transmitted to one or more other elementary decoding steps, at least one extrinsic information item obtained during one iteration being transmitted to another iteration ($\Lambda_2(x)$ in Figure 21 of Moher is an extrinsic information item obtained during one iteration being transmitted to another iteration transmitted to one or more other elementary decoding steps), and the characteristic quantity determination step includes calculating the at least one characteristic quantity during an elementary decoding step from a set of extrinsic information items at the output of the said elementary decoding step (Figure 21 of Moher teaches calculating the at least one characteristic quantity $\Lambda_1(x)$ during an elementary decoding step from a set of extrinsic information items ($\Lambda_2(x)$ at the output of the said elementary decoding step).

35 U.S.C. 102(e) rejection of claim 6.

Col. 17, lines 15-30 in Moher teach that the characteristic quantity $\Lambda_1(x)$ in Figure 21 of Moher is calculated from a ratio of statistical/probability functions. Probabilities are always positive hence equal to its own absolute value and are associated with an expected value. In a discrete probabilistic system with exactly one outcome, probability is substantially equal to the mean value.

35 U.S.C. 102(e) rejection of claim 8.

Moher teaches the decoded information quality parameter determination step determines the decoded information quality parameter $\Lambda_2(x)$ in Figure 21 of Moher from a characteristic quantity $\Lambda_1(x)$ calculated in the characteristic quantity determination step

during an elementary decoding step from a set of weighted output information items $b_1,\ldots, b_k$ of the elementary decoding step and other characteristic quantities $\Lambda_1(x)$ calculated during previous elementary decoding steps from sets of weighted output information items $b_1,\ldots, b_k$ corresponding to the set of weighted output information items $b_1,\ldots, b_k$ of the elementary decoding step, and at least one configuration parameter u, N, the said decoded information quality parameter $\Lambda_2(x)$ being associated with a set of decoded information items $b_1,\ldots, b_k$ corresponding to the set of weighted output information items $b_1,\ldots, b_k$ of the elementary decoding step.

35 U.S.C. 102(e) rejection of claim 9.

Moher teaches that the decoded information quality parameter determination step determines the decoded information quality parameter $\Lambda_2(x)$ in Figure 21 of Moher from characteristic quantities $\Lambda_1(x)$ calculated during an elementary decoding step corresponding to the last elementary decoding step in the decoding procedure (Note: $4_1(x)$ is decoded in each iteration including the last one).

35 U.S.C. 102(e) rejection of claim 10.

Moher teaches that the decoded information quality parameter determination step determines the decoded information quality parameter $\Lambda_2(x)$ in Figure 21 of Moher from a single characteristic quantity $\Lambda_1(x)$ calculated during the last elementary decoding step in the decoding procedure (Note: $\Lambda_1(x)$ is decoded in each iteration including the last one).

35 U.S.C. 102(e) rejection of claim 11.

Moher teaches that the decoded information quality parameter includes $\Lambda_2(x)$ in Figure 21 of Moher an integer number representing the probable number of errors which exist in the set of decoded information items (Col. 17, lines 15-30 in Moher teach that the characteristic quantity $\Lambda_1(x)$ in Figure 21 of Moher is calculated from a ratio of probability distribution functions. Probability distribution functions represent the probable number of errors, which exist in the set of decoded information items).

35 U.S.C. 102(e) rejection of claim 13.

Moher teaches that the decoded information quality parameter includes $\Lambda_2(x)$ in Figure 21 of Moher is a parameter characterizing decoding conditions, hence includes a parameter characterizing decoding conditions.

35 U.S.C. 102(e) rejection of claims 14 and 15.

Moher teaches that the decoded information quality parameter includes $\Lambda_2(x)$ in Figure 21 of Moher is a parameter characterizing transmission conditions, hence includes a parameter characterizing transmission conditions.

35 U.S.C. 102(e) rejection of claims 16 and 24.

Moher teaches that the decoded information quality parameter includes $\Lambda_2(x)$ in Figure 21 of Moher uses a predetermined algorithm allowing calculation of the decoded

information quality parameter $\Lambda_2(x)$ as a function of the configuration parameters u, N, and one of more of the characteristic quantities $\Lambda_1(x)$.

35 U.S.C. 102(e) rejection of claim 18.

N=K in Figures 1 and 2 of Moher.

35 U.S.C. 102(e) rejection of claim 19.

Moher teaches that the received information item is processed by means of decoding sequences $y_1,\ldots, y_k$ to provide a set of decoded information items $b_1,\ldots, b_k$ as a sequence of binary information items $b_1,\ldots, b_k$ representing a fraction of a decoding sequence.

35 U.S.C. 102(e) rejection of claim 20.

Moher teaches that Col. 17, lines 15-30 in Moher teach that the characteristic quantity $\Lambda_1(x)$ in Figure 21 of Moher is calculated from a ratio of statistical/probability functions. Probabilities are always positive hence equal to its own absolute value and are associated with an expected value. In a discrete probabilistic system with exactly one outcome, probability is substantially equal to the mean value.

35 U.S.C. 102(e) rejection of claim 21.

Col. 16, lines 47-49 and col. 17, lines11-14 in Moher teach at least one puncturing step and the decoding procedure comprises at least one corresponding de-puncturing step.

35 U.S.C. 102(e) rejection of claim 22.

Moher teaches a combination of transmission methods using a number of decoding procedures associated with the same coding procedure (see Figures 1 and 2 in Moher), decoded information quality parameters $\Lambda_2(x)$ in Figure 21 of Moher obtained respectively at the end of each of the decoding procedures form weighting factors for the corresponding sets of decoded information items $\Lambda_1(x)$ used to form a weighted combination of the sets, $b_1,\ldots, b_k$.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 17 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moher; Michael I. (US 6161209 A) in view of Hladik; Stephen Michael et al. (US 5734962 A, hereafter referred to as Hladik).

35 U.S.C. 103(a) rejection of claims 17 and 25.

Moher substantially teaches the claimed invention described in claim1-4, 6, 8-11 and 13-16 (as rejected above).

However Moher does not explicitly teach the specific use of a reference table.

Col. 6, lines 42 in Hladik, in an analogous art, teaches that each of the N component decoders in Figure 4 use the MAP algorithm of columns 7-8 in Hladik; each of the decoders uses the matrix Γ to weight α and β prior to calculating λ, i.e., each of the λ's from the respective Decoders 1 to N-1 in Figure 4 is weighted output information; Equation 1 in col. 7 teaches λ from Decoder N is a decoded characteristic statistical quantity; hence Decoder N in Figure 4produces a decoded characteristic statistical quantity λ from the set of weighted output information λ's from the respective Decoders 1 to N-1 in Figure 4. the matrix Γ is predetermined reference table.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Moher with the teachings of Hladik by including use of a reference table. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a reference table would have provided the

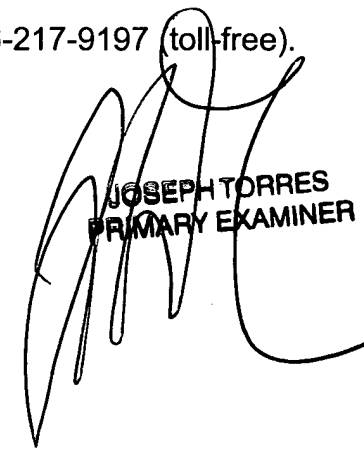
opportunity to provide the flexibility to change the functional aspects of the calculating unit as all software solutions do.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Art Unit 2133